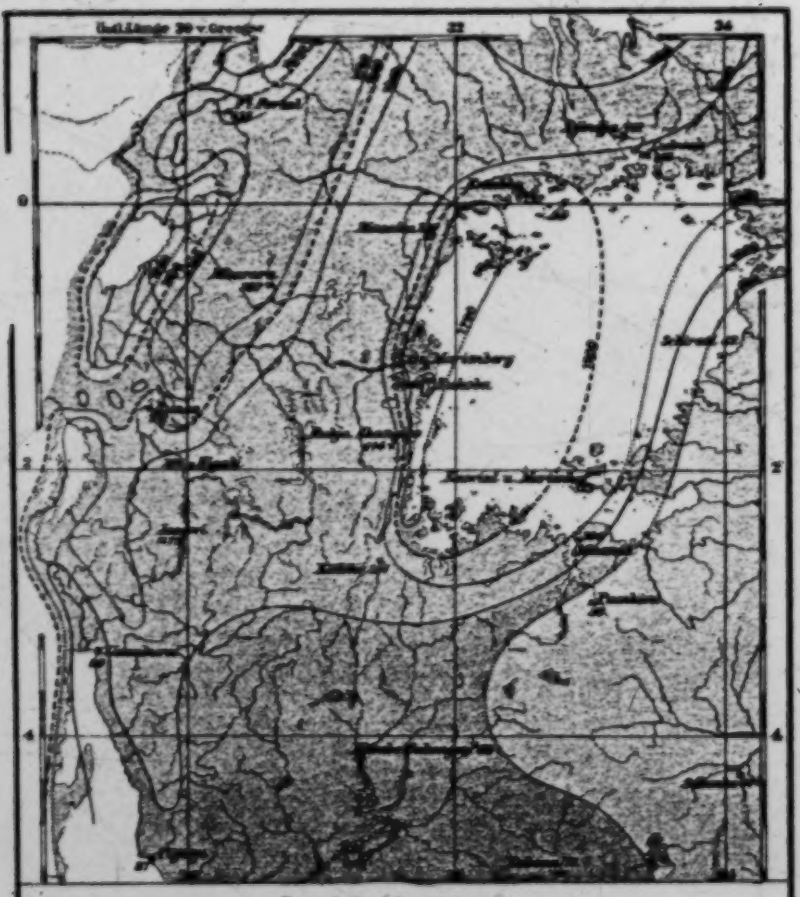
133 everywhere only sluggish waters run in the relatively recent valleys. To all appearances a general damming up of waters has taken place due to recent block movements which have caused an enormous growth of swamps in the valleys in Urundi, especially in the north and northeast, and in the entire interlacustrine region. Its main cause is insufficient drainage in the network of streams of the Kagera River on the one hand and in that of the Malagarasi on the other, since their level of erosion has apparently been raised by more recent block movements in both areas.

The two big rivers mentioned above divide Urundi into two hydrographic systems: the larger northern system drains into the Kagera, Lake Victoria, the Nile, and, therefore, into the Mediterranean; the smaller southern one into the Malagarasi, Lake Tanganyika, the Congo River, and, therefore, into the Atlantic Ocean.

●132 Since Urundi is between 2 1/2 and 4 1/2 degrees south latitude, it has, like Ruanda, an equatorial climate with two rainy seasons and two dry seasons. The rains occur soon after the sun has reached its zenith in April and October. The amount of precipitation, approximately 1,250 millimeters in the north and less than 1,000 millimeters in the south, is not great for a tropical region, yet it is still plentiful and evenly distributed. The average annual temperature fluctuates about 20 degrees Centigrade. It is higher in the east, and in the mountains of the west the thermometer almost approaches zero in July. Day after day a vigorous east wind blows across the highlands. In the mornings there are often dense mists in the valleys.

137 The warm temperature, the amount of precipitation, and the distribution of rain would lead one to expect extended forest growth in Urundi, but this is not the case. Urundi is quite predominantly grassland (Plate 1a), pasture land at high altitude, like Ruanda. This is because the natives cut down the forest [311] to make fields and pastures. Toward the east in the direction of Uha where the country is lower, the grassland gradually turns into a tree and tussock grass steppe (Plate 3b). The grass grows higher and wilder in Urundi than in Ruanda since the grassy plains



Precipitation Map
according to H. Maurer, P. Heidke and W. Pietsch.

1 2 3 4 5

Annual Rainfall in Millimeters:

1. 500-750
2. 750-1000
3. 1000-1500
4. 1500-2000
5. over 2000

The annual totals and stations (x) given in centimeters.

[End map, upper right, in color]

133 a chimney opening at the bottom (1), has a diameter of about 400 meters.

1. In 1912 there were two juxtaposed chimneys. The wall that divided them disappeared in 1915.

The column of smoke, which was rather light between the years 1908 and 1926, thickened in January, 1927 and may be seen from afar.

Its neighbor to the right, the Nyamlagira (3, 056 meters), is more active. The mouth of the volcano is nearly 2, 000 meters in diameter.

Lava in fusion is constantly boiling in four or five small chimneys scattered along part of the old crater. It exudes fumaroles /sic/ and sulphurous vapors. The volcano called Mugunga or Ntsuro, not far from Lake Kivu, still emits some occasional vapors. Its eruption is of recent date, since it revived at the end of December, 1912.

Let us still mention the Bwana-Mahalage, which is nearly lost among blocks of lava. It erupted twice between 1903 and 1905, and since then has given no signs of life.

Its crater is now almost completely obstructed, and its diameter is insignificant.

In places where lava has begun to desintegrate, as happened [134] in the Bugoyi plain, which extends northeast of Lake Kivu, the soil is quite fertile.

The aspect of the land is imposing and pleasant to gaze at. The lake with its islands, the high peaks that block the horizon to the north, the plain strewn with craters, and the active volcanoes [132] make it an area unsurpassed in scenic value. The climate is temperate and the soil rich. It is volcanic soil that keeps disintegrating without ever being exhausted. One finds in the fields sorghum, peas, beans, sweet potatoes, and eleusine. Edible arum is rare and so is manioc, but potatoes and wheat are becoming increasingly widespread. The soils of Byahi and Riverere are most propitious to the

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791 The dangers which formerly threatened them in times of drought were such as to keep them away from the capital.

130. Before mentioning their duties, we deem it useful to list the names of the native months and seasons with a short explanation of their meaning. This will make it easier to understand the importance of these men to their compatriots, whom they fleece shamelessly.

Part One

Months, Seasons, and Principal Rains

I. Native Months

1.	Nzeri . . . . . October	7.	Werurgwe . . . . . April
2.	Okwakira . . . . . November	8.	Mata . . . . . May
3.	Ogushingo . . . . . December	9.	Gichurassi . . . . . June
4.	Okuboza . . . . . January	10.	Kamena . . . . . July
5.	Mutarama . . . . . February	11.	Nyakanga . . . . . August
6.	Gashantare . . . . . March	12.	Gatumba gatoya . . September
			Gatumba kanama . "

Nzeri, October, is the first on the list (imfura y' amezi). The Banyarwanda, indeed, count from October onward and regard this month as the most important because the cultivation of beans begins at this time.

Okwakira, November, comes from the verb kwaka (or kwakira), which means "to shine" because the sun is quite strong. /426/

Ogushingo, December, is reputed to be a very rainy month.

Okuboza, January, comes from the word kuboza, "to rot." It often happens, indeed, that the rains of the preceding month persist and seriously damage the crops.

The word Mutarama, which comes from the verb gutarama, "to nibble" (like the verb guhekenya, with which it is synonymous) was given to the month of February because it is at that time that one finds in certain parts of Ruanda, here and there, a few ears of ripe sorghum which children do not hesitate to cut off and eat.

221 805 [539] Werurgwe, April. This word designates microscopic insects which occasionally prey on sorghum and quickly destroy it. Hence the expression, "Go and see whether the (above-mentioned) insects have attacked (the sorghum)" (Mulebe ngo Werurgwe itayajamo).

[539] Gichurassi. This is the baleful month (ukwezi kubi) during which the annual mourning which lasts 15 days takes place at court. It is also the time of colds and bronchitis, hence the common expression, "He who lies down with a cold will be carried away (made to die) by the month of June" (Uryamye ibichurane, igichurassi kizamutwara).

Kamena, July. This month is thus called from the word kumena, "to shatter" or "to tear out," because in those provinces of Ruanda where sorghum is cultivated only once a year people harvest the ripe ears in order to crush the grain and make bread (umutsima), which they have not tasted for a long time.

Nyakanga, August, comes from the word gukanga "to frighten." It is called thus because it is often fatal to old cows (amabuguma, ibibuguma), hence the common expression, Nyakanga ikanga amabuguma, [551] "The month of August frightens old animals," that is to say, causes them to die.

The two terms Gatumba gatoya and Gatumba /427/ kanama formerly served to designate two months, that is, August and September, prior to the creation of the month of Mata, May. Today they indicate the two fortnights in September, thus named from the word gutumba, [132] "to swell," because the clouds begin to gather in the sky and the rains begin to fall.

As for the month of Mata, it was created at the instigation of the sorcerers under the reign of Lwabugiri.

Mata literally means "milk," and in a figurative sense it means "abundance." It is also the name of a hill at Marangara, where as already mentioned Mutara and his son Lwabugiri established their residence because this area is reputed to bring good fortune to those who inhabit it. It is said that once for several years the rains failed to come and the crops did not ripen. In order to cope with this grave difficulty, it was resolved that henceforth a new month would be added to the year, and that this month would precede the month of

221 805 mourning (gichurassi) so as to give the crops time to ripen. And thus it was done. The name of the hill, a name of good omen, was given to the new month.

● 132 805 The native months correspond more or less to those of our solar year, owing to the elasticity with which the Banyarwanda endow their lunar divisions. They take the short rainy season, indeed, as their point of reference for cultivation and sowing. This rainy period bears the name of Nzeri and corresponds roughly to our month of October (1).

1. In some areas of vast Central Africa, the Blacks use the word masika, which means "rainy season" and belongs to the Kiswahili vocabulary. This term is preceded by the qualifiers "little" or "big" to denote the two rainy seasons. The little masika begins in October and usually ends in December. The big masika covers the months of February, March, April, and part of May.

We have heard it said that the Batutsi, herders living in the open air, acquired a practical knowledge of time from the plants and flowers that grow /428/ at regular intervals, and that they imparted this knowledge to the cultivators.

II. Seasons

221 805 The Banyarwanda also distinguish four seasons.

1. Uruhira, from the verb gushya, after its applicative /sic/ guhira, "to burn," designates the end of summer because this is the time when grass is burned everywhere. Another synonymous term is used, ku (1) Muyonga (ivu), which means "the time of ashes." One

805 22/ In katumba the people begin burning off the grass on the hills.

Most of the weddings take place in nseri, because much beer can be brewed in this month. For the same reason, most fights occur then.

132 805 There are three seasons in Kissaka.

[296] I. Itumba, the great rainy season extending from March to May.

II. Ichanda, the great dry season from June to October.

III. Ruhira, the secondary rainy season from November to January and sometimes February.

The secondary dry season in February does not seem to have a special name.

805 Father C. Lecoindre told me that he had the impression there were 13 months in the Ruanda year and pointed out that on my list the month of kashantare between mutarama and werurwe was not shown.

The art of chronology is only slightly developed in Ruanda, and the Bahutu seem essentially to know only the periods for certain field chores, to which they give special names, for example:

Itumba ya massaka (in the autumn),
Itumba lyi bishimbo,

or solar time:

Rugaryi (little sun),
Itsi (big sun).

644 805 On the other hand, life in Musinga's royal residence, at least the arrival of fresh drum guards with the new moon, is regulated by the lunar division of the year, and Father C. Lecoindre's observation seems to have many points in its favor. For example, it is said that at the court of the king there is mourning during the [834] first half of the month kichurasi. During this time men allegedly have no sexual intercourse with women. The drums at the king's court are beaten only once around 11 o'clock to greet (ndamutsu) the king; they are said to be tied up (kuzirika). The Batwa do not entertain the king with their songs during the evening gatherings. The king pronounces no sentences and accepts no presents. At ordinary law proceedings the victorious party neither sings his song

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(about 1,000 miles from the two nearest sea-ports, Mombasa and Dar-es-Salaam), probably accounts for the country's long isolation from Arab and European contacts, in spite of its easily accessible frontiers in the north and south. Although slaves were occasionally sold to the African middlemen in touch with Arab traders operating in the neighbourhood of Ruanda, it seems that the traders themselves never penetrated the country. At all events Ruanda was never a regular place of supply. The first European reported to have been in the country was Count G. A. von Götzen, a German officer leading a scientific and military expedition across Africa from the Indian to the Atlantic Ocean. He stayed in Ruanda only for a few weeks, in 1894.

The interior highlands, which have been compared to the massif of Abyssinia and to the mountains of Bohemia, or even to Switzerland and Tibet, are not very large. Their longest north-south extent in a straight line is about 100 miles, the extent from west to east being about 140 miles. The area of present-day Ruanda is 26,338 square kilometres (10,166 square miles). In 1907 Professor Jan Czekanowski, a member of the Duke of Mecklenburg's expedition to Central Africa, estimated it to cover about 28,900 square kilometres.[1]

The climatic effects of equatorial latitude are mitigated by the elevation. In the Congo-Nile mountain chain the temperature may drop to freezing point, but the greater part of Ruanda enjoys a temperate climate. The average is about 20° C. (68° F.), and the maximal variations (which are greater between day and night than between the seasons) rarely exceed 10° C. (18° F.) above or under the average. In the eastern lower part the temperature is, of course, higher.

Similar distinctions must be made for rainfall in the high mountains of the west, the highlands of the middle country, and the Kagera lower region of the east. In the first region rainfall averages 1,250 mm. a year (50 inches), in the second it is between 1,250 and 1,000 mm. (50 and 40 inches) and in the third less than 1,000 mm. (40 inches).[2] These figures alone do not have very much bearing on soil fertility, as the significance of rainfall depends on other factors, such as volume and intensity of precipitations, declivity of ground, type of vegetation, and characteristics of the soil.

[1] Czekanowski, 1917, p. 114. [2] Ministère des Colonies, 1931b, p. 63.

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There is as much as a one-month range of variations in the dates of the rainy and dry seasons each year. The precipitations are very irregular. Sometimes for a few weeks there is heavy rainfall lasting ten or twelve hours followed by a few dry days, at other times there is a 2- or 3-hour shower every day. Besides this fundamental irregularity there is no uniformity throughout the country. Owing to the very uneven relief, neighbouring regions or even neighbouring groups of hills and valleys, may have quite dissimilar climates.

Although it is believed that the country was covered with forest in the remote past, now only three per cent. of the surface of Ruanda is woodland; even if savannah with trees is taken into account the figure is not brought up to more than 6·5 per cent.[4] At the beginning of the century the figures were almost certainly not higher, and very likely lower. Indeed, the policy of the Administration has been to attempt to protect by regulation the forests which were left and to promote the replanting of trees. The present-day typical Ruanda landscape, eucalyptus-covered hills and roads bordered by three or four lines of trees, is new. Fifty years ago the country had an even more denuded appearance than it has today.

The result of the scarcity of trees in a country of steep hills has been erosion. Torrential rainfall has washed off the more fertile top soil. The deterioration of the ground has been a long process which has not yet been reversed. The north-western part of Ruanda provides an exception to the general poverty. Here the soil is of volcanic origin, formed from recent lava, and rich. The land at the bottom of valleys everywhere is, of course, notably better than on the slopes.

A good top-soil is important not only for cultivation: allowing a slow infiltration of water, it helps to form subterranean watersheds situated not too deeply underground. A decrease in this top-soil has had the effect that some of these practically superficial water reserves which feed sources have drained away. I have been told more than once by old people that in such or such a place there was a water source when they were young. When digging a well now one has to go very deep.

These phenomena, erosion, impoverishment of soil, and drying up of sub-soil, are not to be attributed only to the action of the purely natural factors mentioned (the heavy rainfalls and the

[4] Ministère des Colonies, 1951b, p. 331.

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tilapia. Fishermen sell it mainly to foreigners: Congolese, Europeans, etc., but they themselves eat it very rarely.

Agriculture was the principal Hutu occupation. The Tutsi considered this kind of manual work below their dignity and the Twa preferred other tasks. Cultivators used the hoe (*isuka*) and a kind of bill-hook (*umuhoro*) as their main agricultural implements.[19] The main cultivated plants were beans and peas, sorghum, eleusine, sweet potatoes, cassava, maize. Besides these basic foodstuffs, there was also a garden cultivation of other plants used to complement the main dishes or to make them more tasty. These were pumpkins and other varieties of gourds, groundnuts, yams, tomatoes, shallots, and red peppers. Around the huts there were groves of bananas, which were widely used as food as well as in banana-beer.

The yearly calendar of agricultural activities was as follows.

Long rainy season

October. There were usually a few rainy days in September. In October the rains began and were not expected to be very abundant. Soil was prepared for the sowing period which began later in the month. Beans, peas, maize, pumpkins, eleusine, and groundnuts were sown or planted. Banana trees were pricked out.

November. Sowing went on. Because of the rains it was possible to plant sweet potatoes and cassava even on hill-tops. Bean fields were weeded.

December. New plots to be used later on were filled. At the end of the month harvesting began.

Short dry season

January. Peas and beans were harvested. Sorghum, maize, and eleusine were planted, and, in the valleys, potatoes and cassava. Beans were thrashed.

February. Late planting time for sorghum. Sweet potatoes and cassava were planted at the bottom of valleys. Eleusine fields were weeded.

Short rainy season

March. Beans were sown, and sweet potatoes and cassava planted on hill-tops. Sorghum was weeded. Second weeding of eleusine.

[19] See Czekanowski, 1917, pp. 136, 140.

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April. Tillage of fallow-land in preparation for potato planting next month. Planting of yams, gourds.

May and first half of June. Second tillage of sorghum fields. Beans were weeded. Potatoes were planted. Banana groves were cleared of grass. Cassava planted on hill-tops was gathered.

Long dry season

June, second part. Sweet potatoes and cassava planted in the bottom of valleys. Granaries were stocked.

July. Harvesting of beans, sorghum, maize.

August. Tillage of soil.

September. Tillage went on. At the end of the month there could be an early sowing of beans.[30]

In agricultural tasks, there was no specialization by sex. Men and women worked together in the fields. Although to a large extent the Hutu culture was permeated by the Tutsi scale of values, they did not share the noblemen's disdain for agricultural work. Their ideal type of successful man was that of a rich and hard-working peasant. They were proud of such a reputation when they achieved it, although they recognized that the status of a powerful Tutsi was much higher. But it belonged to another order practically closed to them. In a hierarchical society, certain ideal types may embody values that are for a lower stratum at the same time supreme but not sought after.

Cattle were never reared for their meat in Ruanda. The Tutsi and Hutu appreciated meat very much, but cattle were not usually slaughtered just to be eaten, except occasionally as when a barren cow was getting old. But the contribution of cattle to the diet was great: milk and butter were the food *par excellence* for Tutsi noblemen. The Hutu also liked dairy products very much, but a good supply of them required a larger number of cows than a Hutu would normally possess. Only cows feeding calves were milked. During the dry season their production was very low. In recent years, the average milk production was only from 1 to 1·5 litres a day (from about 1¾ pints to 2¼ pints) including that taken by the calf. Hides were formerly used for clothing purposes.

As may be expected in a society dominated by pastoralists, livestock was a major focus of interest in Ruanda culture. Its importance in the political structure—which will be considered

[30] See Schumacher, 1942 and Eversertz, 1947, pp. 61-69.

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later on—adds still further to its interest. There was a very elaborate series of prescriptions and taboos concerning the care of cattle, and a very full terminology which took into account the differences in colour of skin, in shape and length of horns, and in origin of possession or ownership, &c.[21] According to experts, Ruanda empirical knowledge of cattle-rearing was quite good.

In this field there was a very strict division of labour by sex. Cattle could be cared for only by men. This restriction was based on magical beliefs regarding impurity, as females before puberty and after menopause were permitted to take care of the livestock. The strictest prohibitions were on women in their menstruating periods. Hutu were not excluded from cattle rearing, and in fact most of the menial tasks were performed by Hutu servants or clients.

The Tutsi were not nomadic pastoralists. Cattle moved according to the seasons from valleys to hills, but usually in the same area. It might happen, however, that when the drought was particularly severe herds had to be led to another area which might be some distance away. But this did not imply any change of residence for the owners of the cattle which were accompanied only by shepherds.

When in October grass began to grow again, the cows were lean and starving. As they recovered strength on new grass, their milk came back. In November rains were sufficient to allow grazing on the hills. Flies were myriad in December. Then the short dry season began. In January, however, there was still too much water in the valleys for cattle to pasture there, and they stayed in kraals, near huts. In February and March they went out again on to the hills. With the rains flies came again. Milk output increased. In April pastures reserved for the dry season were closed. At the beginning of the dry season (end of May, beginning of June) milk diminished as the grass dried up, and grazing was confined to the valleys. July was not a bad month because cows could pasture on the harvested fields. Flies disappeared in the dry season. August and September were the two worst months for cattle.[22]

Sheep and goats were also kept for their skin and their milk. The Hutu ate goat-flesh but mutton was ritually forbidden. Even today it arouses a very marked repugnance and only the shameless Twa will eat it.

[21] Cf. Vanhove, 1941, pp. 46-59. [22] Schumacher, 1942.

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It should also be pointed out that the supply of the staple foods was usually short at the end of the dry season and that starvation periods, in which many people died, were occurring several times in a life-time. For instance in a thirty-year period (1900–30) among the events used as references to assess the age of people, three famines are remembered: in 1908, 1918, and 1924.

The above considerations take into account only the total production of available food in the country. But it is obvious that in a society composed of several groups very unequal in power, access to food was not the same for everybody. It seems that we may safely infer that the normal diet of many Hutu was barely adequate to sustain people who had to spend a considerable amount of physical effort in agricultural tasks.

In the preparation of meals, two facts relevant to health should be mentioned. Firstly, the methods of cooking very often resulted in a diminution of the nutritive value of food. For instance, beans cooked in water lose from one-sixth to one-fifth of their carbohydrates.[27] Secondly, the standards of cleanliness in food preparation were very high among the Tutsi, though more for magical than for hygienic reasons. This applies particularly to milk. To avoid flies and dust, receptacles containing milk were always closed with basketwork conic covers adorned with elongated geometric patterns. It is believed that if milk comes into contact with anything impure, the cow would be harmed. The contaminating substances were not always connected with the Western idea of dirtiness. For instance water was considered dangerous to milk. Consequently the wooden vessels in which milk was kept were not washed out with water but with cows' urine.

The equatorial situation of Ruanda, combined with the rather cold climate due to its elevation, resulted in the spreading of diseases characteristic of tropical as well as of temperate regions. Yaws, typhoid fever, tuberculosis, recurring fevers, and a large variety of intestinal diseases are quite common in Ruanda today.[28] They are not new diseases resulting from new conditions introduced by the European occupation, such as malaria, which was unknown in Ruanda except in the narrow strip adjacent to the Ruzizi River until roads were built permitting a very rapid transportation of people, or some venereal diseases which spread

[27] Ministère des Colonies, 1951b, p. 49-51.
[28] Cf. Lestrade, 1955; Vincent, 1953, pp. 16-18.